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Additional Data on Brood Parasitism in the Honey-guides

By Herbert Friedmann [1]

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Additions to our knowledge of the reproductive parasitism of three African species of honey-guides are presented herein and correlated with earlier information. The birds are *Indicator indicator*, *I. minor*, and *Prodotiscus regulus*. Information recorded in this paper for the latter species, while meager in quantity, is relatively important because so very little was known at the time of my previous reports in 1955 and 1958. The data on the two *Indicator* species, on the other hand, are far more extensive but of a kind that lends itself to brief and easy reporting.

The new data for *Indicator* stem from a total of 73 additional instances of parasitism, 49 for *I. indicator* and 24 for *I. minor*. The majority of these cases occurred with previously known host species, and they support very well the earlier estimates of the relative frequency of choice of the common hosts. They also bear out the fact that usually only a single egg is deposited by the parasite in any one nest of a host. In the present paper, I discuss solely those hosts

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of each of the honey-guides for which the recent data involve previously unreported hosts, hosts reported for the first time in scattered journals since my last paper, or hosts that offer information requiring significant alterations or extensions of earlier summary statements. There is no need to tabulate more and more instances of a repetitive nature unless they are accompanied by biological observations.

Besides accumulating such records from the recent literature, I have been able to include much unpublished information kindly supplied to me by various friends in Africa and Europe. Among these should be mentioned R. K. Brooke in Rhodesia, G. Duve in the Transvaal, R. Kreuger in Finland (data *ex* egg collections), H. M. Miles in Rhodesia, and G. Symons, in Natal. To each of these gentlemen I herewith acknowledge my indebtedness and convey my thanks.

Greater Honey-guide: *Indicator indicator*

In my 1955 and 1958 reports on the greater honey-guide, I was able to present data on 106 cases of parasitism on 32 species of birds, or, counting races, on 38 species and subspecies of hosts. The data accumulated since then bring the total to 155 instances, involving, in all, some 35 species or 42 species and subspecies of victims. The additional cases support the earlier conclusions that bee-eaters, hoopoes, wood hoopoes, barbets, woodpeckers, and starlings are the main hosts of the greater honey-guide. As might have been anticipated, all the new records are of hole-nesting birds, the "new" hosts comprising two kinds of kingfishers, a roller, and a barbet. The most frequently reported host species are the little bee-eater, *Merops pusillus*, with 30 records; the pied starling, *Spreo bicolor*, with 20; the hoopoe, *Upupa epops africana*, with 19; the golden-tailed woodpecker, *Campethera abingoni*, with 8; the red-billed wood hoopoe, *Phoeniculus purpureus*, and the crested barbet, *Trachyphonus vaillantii*, with 7 each. These are the birds that are the mainstay of the greater honey-guide; all the others, with from six to one records apiece, are the less usual fosterers, some of which, however, are regularly, but less frequently, parasitized. Among these are several kinds of bee-eaters, kingfishers, and barbets. Other hosts, for which only single instances have been reported, can only be looked upon as unusual.

It is, of course, to be expected that when further data become available from some portions of the African continent that still are entirely unrepresented in our total body of information, some local host species, possibly not yet in our lists, may turn out to be locally important and frequently used hosts in their respective areas.

Pygmy kingfisher *Ceyx picta* (Boddaert)

The southern race, *C. p. natalensis*, of this diminutive kingfisher was added to the list of known hosts of the greater honey-guide by Benson and Pitman (1966, pp. 26–27), on the basis of a nest containing one egg of the parasite and three of the host found at Livingstone, Zambia, October 21. The disparity in size between the two species makes one wonder if the pygmy kingfisher could rear a young greater honey-guide successfully.

Striped kingfisher *Halcyon chelicuti* (Stanley)

The recent reporting of a fourth instance of this kingfisher as a honey-guide host in Southern Rhodesia (Benson, Brooke, and Vernon, 1964, p. 67) demonstrates that this kingfisher is a regular victim, at least in that area. All the records refer to the nominate race of the host. The fact that this kingfisher is largely a fish eater and not an insect eater may subject a young honey-guide to a diet quite different from what it receives in nests of other hosts.

Brown-hooded kingfisher *Halcyon albiventris* (Scopoli)

Two races of this insectivorous kingfisher, *albiventris* and *orientalis*, are known to be victims of *Indicator indicator*. In my earlier account (1955, p. 140) I listed two South African records for the nominate race, whereas, more recently, Brooke (1965, pp. 6, 9) reported one case for *orientalis*, from the Lingove River, Furancungo district, northern Tete province, Mozambique, Oct. 20, 1928, a record that had remained unpublished for several decades.

Boehm's bee-eater *Merops boehmi* Reichenow

Benson, Brooke, and Vernon (1964, p. 67) list this bee-eater as a host of *I. indicator* in Zambia. While they give no further details, the record appears to be definite. Previously there was a single, not completely certain record from Chikwawa, Malawi.

White-fronted bee-eater *Merops bulocki* Vieillot

This bee-eater is known as a host of the greater honey-guide in Southern Rhodesia and in Kenya. With six records now available, it seems obvious that it will be found to be one of the "usual," regularly chosen fosterers. This host has been found rearing the young parasite in addition to merely having the parasite's eggs laid in its nest. All the records refer to the host race *bullockoides*.

Swallow-tailed bee-eater *Merops hirundineus* Lichtenstein

Previously recorded as a host near Elisabethville, Congo, and at Dedza, Malawi, this bee-eater recently has been found to be victimized in Zambia as well (Benson, Brooke, and Vernon, 1964, p. 67). The nominate race of the host is the one involved in both instances.

Abyssinian roller *Coracias abyssinica* Hermann

This roller, one of the largest birds known to be used as a host by the greater honey-guide, only recently has beer added to the host catalog by Parker (1966, p. 81), who reported a set of eggs in the British Museum, containing one *Indicator* and three *Coracias*, collected by Schuel at Zaria, Nigeria, Apr. 13, 1964.

African hoopoe *Upupa epops* Linnaeus

The hoopoe, subspecies *africana*, for which earlier (1955, pp. 143–144) I had compiled nine records, is clearly one of the birds most frequently selected as a fosterer. I know at present of 10 additional records, and it now appears that little is to be gained from further accumulations of such cases. So far, I have not heard of the lesser honey-guide, *I. minor*, affecting the hoopoe.

Red-billed hoopoe *Phoeniculus purpureus* (Miller)

Increasing information indicates that this species is a fairly regular host of the greater honey-guide. I have now learned of seven instances, involving four races of the red-billed hoopoe: *purpureus*, *marwitzi*, *angolensis*, and *guineensis*. Jubb (1966) has found that this bird is a real fosterer, not just a victim. He noted a young greater honey-guide reared successfully by a pair of red-billed hoopoes. The latter continued to feed it regularly for at least 12 days after it had left the nest fully feathered, and they were observed feeding it even as late as 22 days after it had fledged. The following (twenty-third) day the young parasite was attacked and driven off by its foster parents.

Yellow-headed barbet *Buccanodon whytii* (Shelley)

This barbet was added to the list of known victims of the greater honey-guide in Southern Rhodesia, by Benson, Brooke, and Vernon (1964, p. 67) on the basis of a single observation. The record refers to the race *B. w. sowerbyi* (Sharpe).

Crested barbet *Trachyphonus vaillantii* Ranzani

This is another host for which enough records now have been amassed to show that it is one of the greater honey-guide's regular victims, especially in Southern Rhodesia, where four of the seven cases known to me have been found.

Golden-tailed woodpecker *Campethera abingoni* (Smith)

This small woodpecker now has been found to be parasitized by the greater honey-guide in South Africa, Malawi, Southern Rhodesia, and Kenya. A total of eight records, involving four races of the host (*abingoni*, *suahelica*, *mombassica*, and *smithii*), demonstrate that this is a frequently used host.

Banded sand martin *Riparia cincta* (Boddaert)

Previously (1958, p. 312), I have known of only one instance of this swallow as a victim; the identity of the parasitic egg as that of *I. indicator* was not wholly certain. Since then, an observation of a fledged young greater honey-guide fed by a pair of banded sand martins near Salisbury, Southern Rhodesia, in January 1966, has been reported by Hosken (1966a, pp. 234–235). Both records refer to the nominate race of the host.

Cape anteater-chat *Myrmecocichla formicivora* (Vieillot)

To the two records listed previously by me (1955, p. 151) three others should be added, all from Natal, information on which was kindly sent me by Mr. Godfrey Symons, who found the nests near Estcourt.

Red-shouldered glossy starling *Lamprocolius nitens* (Linnaeus)

At Estcourt, Natal, on Nov. 29, 1932, Godfrey Symons (in litt., 1963) found a nest of this starling with one egg of a greater honey-guide and two eggs of the starling. Previously I had known of two instances of parasitism on this bird. It probably will be found to be a fairly regular host in Natal.

Lesser Honey-guide: *Indicator minor*

Information on the hosts of the lesser honey-guide also has increased by observations of nearly half as many new instances as were available to me for my 1955 and 1958 statements. The black-collared barbet, *Lybius torquatus*, is clearly the most frequently used host, with some 43 records (an increase of 13 since 1958); and the pied barbet, *Tricholaema leucomelan*, is probably the next most heavily parasitized, with nine more records since 1958. As in the case of the greater honey-guide, all the recent host records are of hole-nesting birds. Only three of these merit special mention at this time, the others being merely repeats.

Little bee-eater *Merops pusillus* (Muller)

Mr. R. Kreuger (in litt.) informs me that he has in his collection a set of five eggs of this little bee-eater with one of the lesser honey-guide, taken at "Mile 100," Accra-Lane Road, Ghana, in March 1943 by F. C. Holman. This is the first record for any host for the race *I. m. alexanderi* of the parasite. It refers to the nominate race of the host, the southern race of which, *meridionalis*, is known to be victimized regularly by *I. m. minor* in Rhodesia. The honey-guide egg measured 22.8 x 15.4 mm.

Bennett's woodpecker *Campethera bennetti* (Smith)

This woodpecker was added to the hosts of the lesser honey-guide by Benson, Brooke, and Vernon (1964, p. 67) on the basis of a single record from Rhodesia. There was a single, earlier, very indefinite record from Malawi.

Golden-tailed woodpecker *Campethera abingoni* (Smith)

To the previous two records involving the nominate race of this woodpecker as a host should be added one for the subspecies *C. a. smithii* (Malherbe) in Rhodesia (Benson, Brooke, and Vernon, 1964, p. 67).

Sharp-billed Honey-guide: *Prodotiscus regulus*

The breeding biology of the sharp-billed honey-guide previously was almost unknown as the few observational records were marred by indefiniteness. The situation now may be improved by the following data.

Hosken (1966b, p. 235) noted during a short period of observation a recently fledged young sharp-billed honey-guide that was fed several times by a pair of grass warblers, *Cisticola lais*, at Inyanga, Rhodesia, Jan. 25, 1966. The young honey-guide paid no attention to other birds feeding nearby on termites and acted as though the *Cisticola* were its parents. The grass warbler in the Inyanga area would be the subspecies *C. l. mashana* Lynes. It is an addition to the known hosts of this parasite.

Duve (in litt., 1967) informs me that he has in his collection two sets of eggs of the swallow, *Hirundo abyssinica unitatis*, each with an egg of *Prodotiscus regulus*, one taken at Lalapanzi, northern Transvaal, Dec. 29, 1958, and the other at Estcourt, Natal, Jan. 25, 1946. The honey-guide egg from the first set measured 18 x 13.4 mm, and it was white with a little gloss and a slight gray trend. Mr. Duve further informs me that an oviduct egg of *Prodotiscus regulus*, also in his collection, is slightly less glossy and it too has a slight grayish tone.

Finally, it should be noted that Clancey (1964, p. 282) reported that one of these honey-guides was seen emerging from a swallow's nest tenanted by white-rumped swifts, *Apus cafer cafer*.

None of these species had been recorded before as hosts of *Prodotiscus regulus*. The only previous records, inconclusive at best, referred to the yellow-throated sparrow, *Petronia superciliosus*, and to the larger stripe-breasted swallow, *Hirundo cucullata* (Friedmann, 1955, p. 260).

The *Cisticola* record is surprising as it adds a host that is not a hole-nester. In our present state of knowledge, we only can accept

Hosken's observations and hope for additional instances to give us a truer picture of the host choices of the sharp-billed honey-guide.

An Uncertain but Suggestive Record

While it is obvious that an unidentified parasitic egg record has little usefulness as a potential increment to knowledge, I may mention one such case, chiefly as a suggestion for further field work. Mr. Godfrey Symons, of Estcourt, Natal, informs me (in litt.) that he has in his collection a set of two eggs of the little tinker-bird, *Pogoniulus pusillus affinis*, with one egg of a small honey-guide, which he considers to be *Prodotiscus insignis*, taken at Wajier, Northern Frontier District, Kenya, Feb. 3, 1941. The honey-guide egg is plain white with a dull texture and measures 15.6 x 12 mm. These dimensions agree with those given by Mackworth-Praed and Grant (1952, p.748) for an oviduct egg of the slender-billed honey-guide, a fact that thus seems to confirm the identification. All of the previous records of the parasitism of this species, however, have been with small passerine birds that are not hole-nesters, birds such as a flycatcher (*Platysteira*), a warbler (*Apalis*), and two white-eyes (*Zosterops*). Mr. Symons informs me that actually he did not see the honey-guide in the field, and that, therefore, his identification is not to be taken as final.

Further, it should be noted that no one has ever found *Prodotiscus insignis* at Wajier. I am informed by John G. Williams (pers. comm.), who is familiar with the area, that it is an unsuitable habitat for this species. This leaves two parasitic possibilities: *Indicator meliphilus* and *I. narokensis*. Nothing is known of the eggs or of the hosts of either of these, but a small barbet such as *Pogoniulus* certainly would seem a likely host for either, and also it would seem that their eggs would be similar in size to those of *Prodotiscus insignis*.

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VOL. 124

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